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UNITED STATES DEPARTMENT OF AGRICULTURE
MISCELLANEOUS PUBLICATION No. 115

Washington, D. C.



April, 1931

**INFORMATION FOR THE GUIDANCE OF FIELD MEN AND COOPERATORS
 OF THE BUREAU OF BIOLOGICAL SURVEY ENGAGED IN THE CON-
 TROL OF INJURIOUS RODENTS AND PREDATORY ANIMALS**

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INTRODUCTION

NECESSITY FOR CONTROL OF WILD-ANIMAL PESTS

The demands made upon the Federal Government some years ago for aid in suppressing those wild animals of the public domain that continually spread out into areas that had been placed under cultivation or used for grazing purposes produced the first Federal cooperative efforts toward the control of predatory animals and injurious rodents. The settler who saw the profits of his early work wiped out by the incursions of wolves, coyotes, mountain lions, and bobcats from the public domain into his stock ranges, and of prairie dogs, ground squirrels, pocket gophers, jack rabbits, and other rodents into his cultivated fields, had no recourse other than to ask the aid of the Government whose lands served as breeding reservoirs from which these predators and rodents came. Otherwise they would reinfest his stocked and cultivated acres in spite of all that he could do to prevent them, either single handed or with the aid of his neighbors.

CONTROL FUNCTIONS OF THE BUREAU OF BIOLOGICAL SURVEY

The administration of wild life by the Bureau of Biological Survey involves not only research into the habits, distribution, and requirements of the varieties, and the conservation of fur, game, insectivorous, and other valuable animals, but also the regulation of activities of a limited number of certain species that seriously interfere with the economic interests of man, and, in the case of some of the larger predators, prey upon valuable game species.

The leadership of the Biological Survey in control operations during the years since 1915 has been requested and encouraged by State and other cooperating agencies. The funds made available from these sources for expenditure under the direction of the district leaders of the bureau have been far in excess of those provided for the purpose from the National Treasury. The investigations of the food and other habits, the geographic distribution, and the relationships of the wild birds and mammals of the country (including rodents and predators) have been carried on for almost half a century and provide the basis for the control work recommended and prosecuted. Research along these lines is being continued by scientifically trained men and will be expanded as funds permit.

It is well for the conservation of the wild life of the country that leadership in the control of injurious species has been delegated to a governmental organization that is concerned with the welfare of the various forms and with the administration of wild-life refuges, one that is charged with the enforcement of wild-life conservation laws, and one that recognizes the desirability of preserving representatives of all forms of wild life on suitable areas.

LEGAL AUTHORIZATION FOR CONTROL WORK

The legal sanction for control work by the Federal Government is contained in congressional direction in annual appropriation acts for the Department of Agriculture and in a special enactment authorizing a definite control program. The appropriation acts making funds available for the use of the Bureau of Biological Survey since the year 1915 have provided for investigations, experiments, demonstrations, and cooperation for the control of wild animals injurious to agriculture, horticulture, forestry, animal husbandry, and wild game, and for the suppression of rabies in predatory wild animals. The special program of control, which was called for by the Seventieth Congress, was drawn up by the Department of Agriculture to cover a 10-year period, and was approved by the Seventy-first Congress (Public Act No. 776, of March 2, 1931).

INSTRUCTIONS PREVIOUSLY ISSUED

Information regarding new developments and improved practices in control procedure has been made available to the field personnel and to cooperators of the bureau from time to time since the inception of the cooperative work in 1915, in mimeographed and printed form, as well as by individual written instructions and personal contact. It is now desirable to compile the more important of the statements as to policy and specific directions in one publication. All control methods are based on fundamental research and give due consideration to safeguarding the useful and harmless forms of wild life and the public interests in general. Field methods have been adapted to meet varying local conditions as called for by research and the experience of field forces. Investigations and experiments are being continued, and as additional information becomes available, field practices will be subject to such modifications and improvements as the conditions warrant.

ANIMALS ON THE CONTROL PROGRAM

THE INJURIOUS RODENTS

Certain species of the rodents that in large numbers infest lands of value for crop or forage production must be eradicated locally to meet the requirements of agriculture and forestry. Those that figure most largely in the cooperative control operations in one part or another of their ranges are the prairie dogs, ground squirrels, pocket gophers, jack rabbits, porcupines, and native and introduced rats and mice. Other groups that locally become unduly numerous and destructive may also on occasion come within the control program. It would be impossible to eradicate everywhere the ground squirrels, prairie dogs, and other rodents that range over vast areas of relatively worthless lands, and such action is not desirable, even on the public domain. In areas of economic importance, however, definite tracts are established where the rodents can be kept under thorough control, and operations are extended sufficiently to prevent reinfestation.

THE PREDATORY ANIMALS

The control of such predatory wild animals as coyotes, wolves, mountain lions, and bobcats is concentrated on areas where serious damage is being done to domestic stock, poultry, and game. Bears are not subject to control except when individually injurious to livestock or property.

OTHER FORMS SUBJECT TO CONTROL

Though the chief control work directed by the Biological Survey is concerned with injurious rodents and predatory mammals, it sometimes becomes necessary to investigate cases of damage by other classes of animal life, including moles, crawfishes, and land crabs, and to recommend measures for their control.

INSTRUCTIONS REGARDING FIELD PRACTICES

THE OBJECTIVE

The underlying policy of the Biological Survey with regard to injurious species of wild animals has been and will continue to be one of control rather than complete eradication. The bureau is not embarked upon a general extermination program, but with every proper consideration for conservation interests, it has as its objective in this field the adequate local control of injurious mammals, so that the burdensome losses suffered by farmers and stock raisers may be reduced to the minimum and beneficial forms of wild life protected from undue destruction by their natural enemies. Though in some cases this may mean local eradication of harmful forms, it will not result in the general extermination of any species.

CONSERVATION, STATE LAWS, AND COOPERATION

The Bureau of Biological Survey is an organization primarily and vitally interested in the conservation and protection of all forms of wild life, particularly where they are more beneficial than harmful. Those engaged under its direction in the control of predatory animals and injurious rodents are instructed to cooperate closely with Federal, State, and local officials intrusted with the administration of wild-life protective laws. They must also observe State and local laws regarding the protection of life and property, the exposing of poisons, and the trapping or otherwise endangering of valuable species. Control operations on State and private lands must be conducted in close cooperation with State officials and with property owners and tenants.

PRECAUTIONS IN HANDLING POISONS

Since poison may be dangerous in the hands of inexperienced and incompetent persons, every possible precaution must be taken when it is used in control operations, to safeguard persons, domestic stock, and harmless and beneficial wild life.

Poisons should not be exposed on private lands without the consent of the owners.

Control workers should familiarize themselves with appropriate antidotes for poisons used and be in a position to administer them promptly should the necessity arise.

RODENT-CONTROL OPERATIONS

Extreme care should be exercised in handling poisons in rodent-control work. Prepared poisons should be placed in strong, properly labeled containers and should be distributed only to assistants working under the direct supervision of bureau leaders or to responsible cooperators.

Strychnine (in the alkaloid form) is the poison most largely used in rodent control, its speedy action making it one of the most humane. Moreover, numerous tests have shown that in the quantities employed in control operations strychnine is relatively harmless to such gallinaceous birds as quail, pheasants, grouse, and domestic chickens. The smaller birds also are safeguarded because of the fact that the grains used in poisoned baits are of the large-kerneled kinds, such as oats, and contain a minimum of weed seeds and cracked kernels. Furthermore, in a large portion of the baits used the kernels are steamed, rolled, and flattened so that their increased size lessens their attractiveness to the smaller birds.

The use of red squill in the control of house rats and mice is recommended, as it is an effective and specific poison for these rodents and relatively harmless to other forms of animal life.

The use of thallium in rodent control will in some places succeed where strychnine alone fails. It should not be used, however, except to a very limited extent in follow-up operations against ground squirrels, prairie dogs, and rats. Such limited use of thallium should be guarded with the greatest care under close and fully competent supervision, as it is extremely dangerous to all life. Though thallium is highly effective in destroying rodents, it can not be over-emphasized that this poison is not to be recommended for general use, except to supplement strychnine in follow-up work. It should never be handled without careful consideration in each particular case of all the potential dangers involved.

Arsenic, cyanides, and phosphorus should not be used or recommended for rodent control, as they are not now known to have any special advantages, and furthermore they may be a menace to other forms of animal life. Not only is phosphorus dangerous to beneficial wild life, but it is particularly unsafe because it sometimes causes fire.

Poisonous gases, which are efficient in the fumigation of burrows, grain bins, and garbage dumps, should be used only by trained and experienced workers in rodent control.

PREDATORY-ANIMAL CONTROL

Poisoning operations for the control of predatory animals should be limited strictly to areas where there is urgent need. They will not be undertaken under the direction of the Biological Survey where trapping or other means of control are practicable and the cost is not prohibitive.

The handling of poisons should be intrusted only to properly trained men working under the supervision of the Bureau of Biological Survey.

Poison stations set for coyotes and wolves should be placed away from the timbered and well-watered areas that are frequented by foxes, raccoons, skunks, minks, and other valuable forms of carnivorous animals.

In many agricultural sections poisons should not be used at all because of the obvious risks.

The methods of handling poisons developed and used by the Biological Survey can be employed most effectively and economically in controlling predatory animals at proper seasons in regions where conditions are favorable. Poison is especially suitable for winter use against predators on some of the great stock ranges of the West, as it can then be employed with little or no danger to useful life. The cost of the same measure of control by any other known means would be practically prohibitive.

The control of predatory animals is an exceedingly difficult and costly task, and the use of poisons in this work, particularly under experienced supervision, materially reduces the expense. When properly used, poison should not be more destructive to other species than the use of traps, and in some cases it has been found to be even less harmful and more humane.

Hunters should take every precaution to protect harmless and valuable mammals and birds and should be familiar with the antidotes for each poison used.

Only strychnine as processed by the Biological Survey should be used in operations against predatory mammals, because it can be handled safely, is constant in effect, and, since it kills quickly, its action is humane.

Baits made of small pieces of perishable fat should be used almost to the exclusion of others by field men and cooperators of the bureau. They should be systematically placed about "decoy stations" consisting of carcasses of worn-out horses or other useless animals or pieces of meat. Wherever possible they should be placed in slight depressions and covered with thin flat stones, pieces of hide, or other light material, as coyotes and wolves can easily detect them under such cover, but they are thus made inaccessible to birds.

Stations where poison is placed should be posted to warn owners of stock or valuable dogs of the danger. Conspicuous warning signs such as those furnished by the Bureau of Biological Survey in its cooperative work should be used for the purpose.

In dispensing poisons for the use of cooperators in predatory-animal control, Biological Survey field leaders are instructed to exercise the greatest care to make sure of the integrity, honesty, and cooperative spirit of those requesting supplies. When the leader has satisfied himself as to the intent of the cooperator, he should keep in close touch with him and observe his methods, to make sure that the poison is being properly used and that no supplies are left in his possession after cooperative work has been terminated.

Studded stations, or those in which the poison is placed in parts of the carcass instead of about it, are to be used only under especially favorable conditions. Their use is sometimes justified along the known runways of predatory animals on high barren mountain ridges, high benches, or stock driveways that can not be visited by the hunter after the first heavy snowfall. Such stations should be at some distance from timber, to make remote the danger of poisoning fur bearers. As soon as trails are open in spring, the hunter is directed to revisit such stations and bury or burn all the baits.

All predatory-animal hunters must visit their poison stations as frequently as possible, and except under extraordinary conditions should avoid making long poison lines. Baits that have become rancid should be destroyed, and on completion of the poisoning work a general clean-up must be made, and all baits possible destroyed. The use of perishable fat baits is particularly recommended for the reason that they are readily disposed of naturally, for those that can not be located usually disintegrate in warm weather and become harmless after they have melted and soaked into the ground.

Bears are ordinarily classed as game animals and are protected as such. Only when they are doing material damage should they be taken, and then by traps or by aid of dogs, and not by poison. State laws on the subject must be observed. Field men and cooperators must exercise the greatest possible care to kill only those individuals responsible for damage, and must remove no more bears from a locality than it is absolutely necessary to take in order to stop the destruction of livestock.

In placing traps for the capture of injurious wild animals every possible precaution is to be taken to avoid the accidental capture of valuable game and fur-bearing animals and other harmless or beneficial forms of wild life. Hunters working under the supervision of the Biological Survey are instructed to visit their trap lines

as frequently as possible and to liberate game animals and foxes, badgers, skunks, martens, minks, raccoons, and other animals accidentally caught, unless they are so injured that they can not survive. In occasional individual cases, however, where fur bearers do serious injury to livestock or poultry, it is permissible to trap and kill them if in accordance with State laws.

The most nearly humane traps available should be used, and trap lines should be so placed that they can be visited at frequent intervals, to avoid any unnecessary suffering, injury, or loss of trapped animals.

